

# Optical Airborne Tracker System (OATS)

Completed Technology Project (2015 - 2016)



## Project Introduction

The Optical Airborne Tracker System (OATS) is an airborne dual-axis optical tracking system capable of pointing at any sky location or ground target. The objectives of the task are to develop a flight test system capable of withstanding an anticipated flight altitude of 30kft and efficiently couple direct solar, sky scattered, and ground reflected light into a fiber coupled spectroradiometer.

The primary objective of the project is to design, fabricate, and demonstrate a low cost, modular tracking system that's capable of meeting air quality, land use, and ocean science airborne optical observation requirements. A successful outcome of this technology maturation and risk reduction effort will be a flexible and modular system capable of flying on various aircraft as well as the software capable of controlling the operations of the tracker.

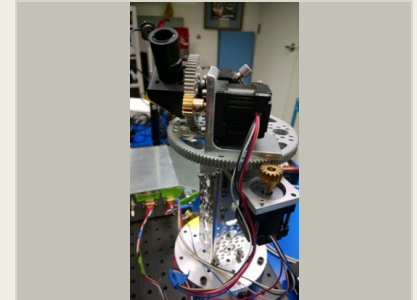
The key elements of the project work are:

- 1) The simplification of the airborne tracker design prototype.
- 2) Develop modularity of the tracker design such that it can be used with multiple instruments and aircraft.
- 3) The use of camera based target tracking, such as the sun, moon, or ground target.

The wavelength range in which this technology is useful is from 250nm to 3microns.

## Anticipated Benefits

The project is anticipated to benefit the Tropospheric Emissions: Monitoring of Pollution (TEMPO) mission by providing a more capable trace gas measurement simulator for airborne deployment. This simulator can be used to calibrate and validate the TEMPO sensor after launch and to help improve science retrieval algorithms.



Prototype tracker motor system

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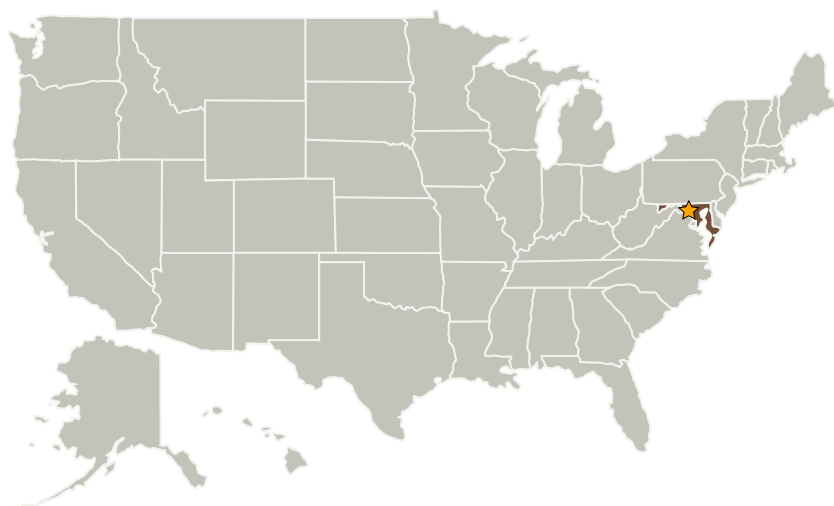
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### Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Universities Space Research Association(USRA)	Supporting Organization	R&D Center	Huntsville, Alabama

### Primary U.S. Work Locations

Maryland

### Organizational Responsibility

#### Responsible Mission Directorate:

Mission Support Directorate (MSD)

#### Lead Center / Facility:

Goddard Space Flight Center (GSFC)

#### Responsible Program:

Center Independent Research & Development: GSFC IRAD

### Project Management

#### Program Manager:

Peter M Hughes

#### Project Manager:

Matthew J McGill

#### Principal Investigator:

Scott Janz

#### Co-Investigator:

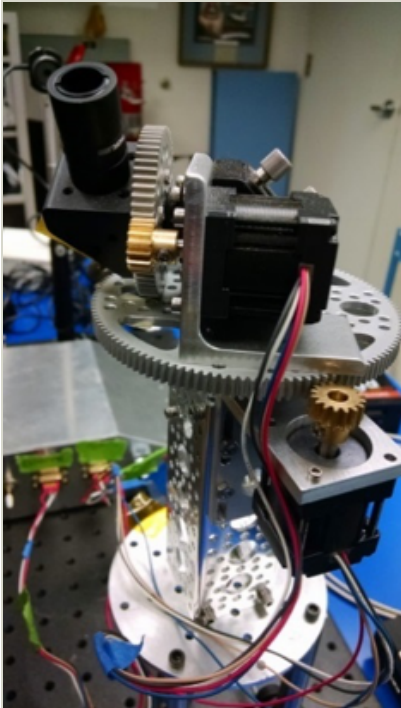
Matthew G Kowalewski

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### Images



#### Optical Airborne Tracker System (OATS)

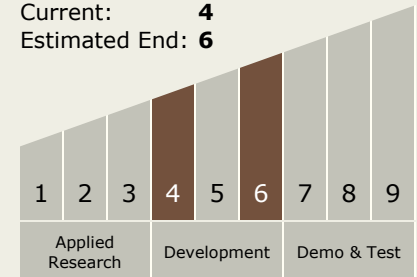
Prototype tracker motor system  
(<https://techport.nasa.gov/image/19091>)

#### Project Website:

<http://sciences.gsfc.nasa.gov/sed/>

### Technology Maturity (TRL)

Start: 4  
Current: 4  
Estimated End: 6



### Technology Areas

#### Primary:

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.1 Optical Communications
    - TX05.1.4 Pointing, Acquisition and Tracking (PAT)